

SIMDIS Analysis and Display

NRL Code 5707.30

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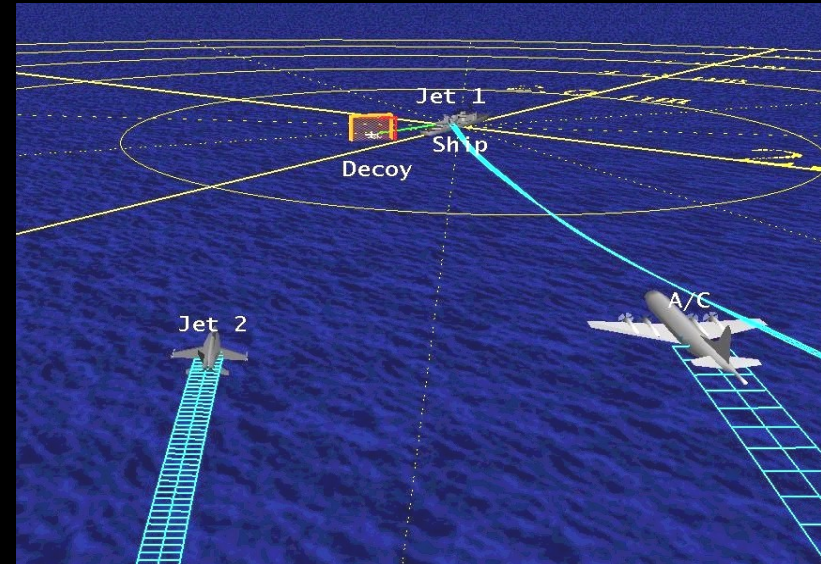
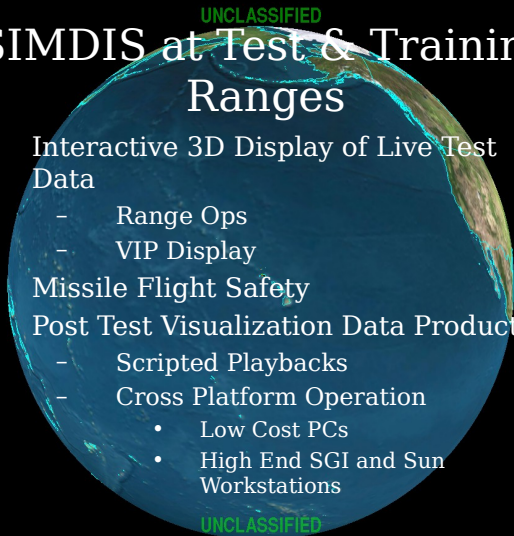
Web site: <https://simdis.nrl.navy.mil>

Email: simdis@enews.nrl.navy.mil

SIMDIS - Visual Analysis and Display

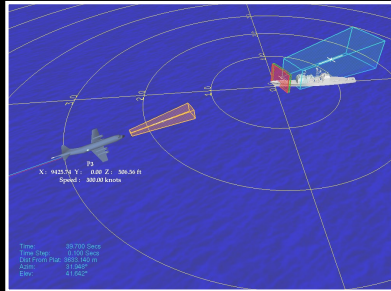
SIMDIS at Test & Training Ranges

- Interactive 3D Display of Live Test Data
 - Range Ops
 - VIP Display
- Missile Flight Safety
- Post Test Visualization Data Product
 - Scripted Playbacks
 - Cross Platform Operation
 - Low Cost PCs
 - High End SGI and Sun Workstations

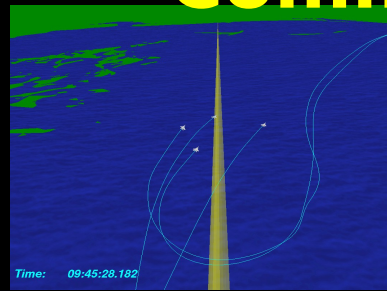


- **SIMDIS is a set of GOTS software tools in use by DoD Ranges and Systems Centers to support 3D analysis and visualization of test and training missions for air, sea, and undersea warfare areas**
- **SIMDIS allows an integrated real-time view of time-space position information (TSPI), system telemetry data, and other real-time data sources . It is used to provide live and post event understanding and insights into complex system interactions.**

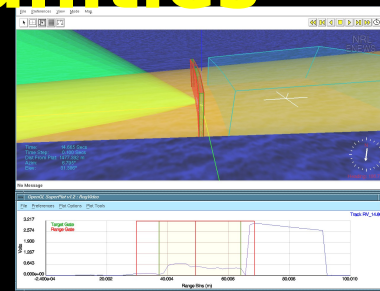
SIMDIS -- Transitioning to the T&E, Training, and Operational Communities



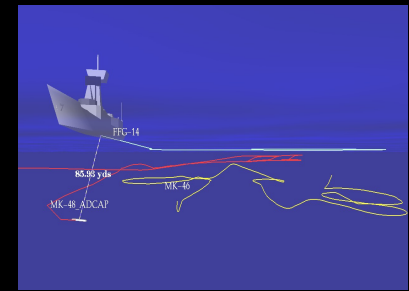
Captive Carry
EW Field Tests



ESM Tests



Synchronized 2D/3D
Simulation/Test Display

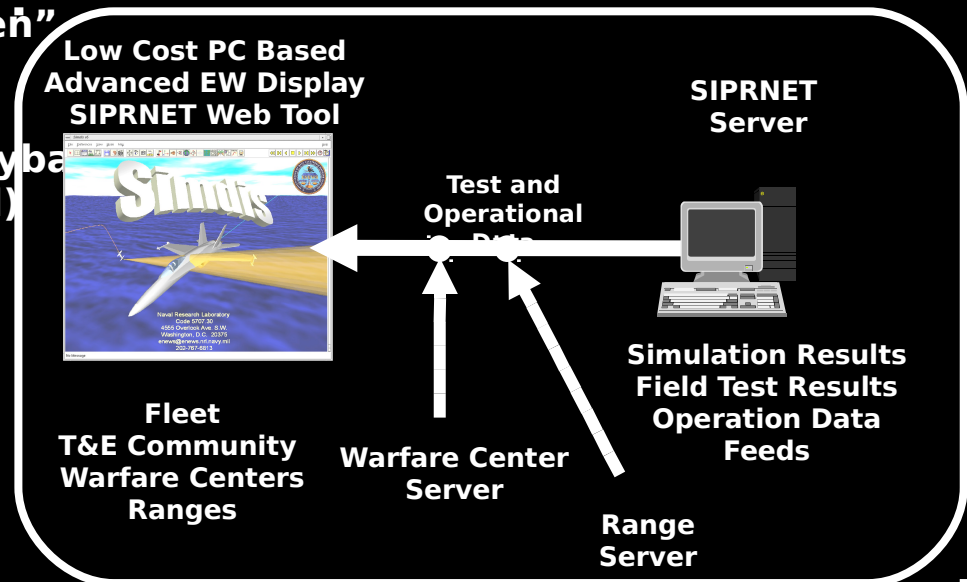


Undersea Field Tests

- **Analysis and Visualization of the “Seen” and “Unseen” (sensor data)**
- **Scripted & Interactive Multimedia Playback (3D, 2D, Images, Digital Video, Sound)**
- **Networked Real-Time 2D/3D Display**
- **Supported on Silicon Graphics, Sun & PC Workstations**



Unix SUN/SGI Workstations, PC Windows 98, ME, NT 4.0, 2000 & Linux Workstations

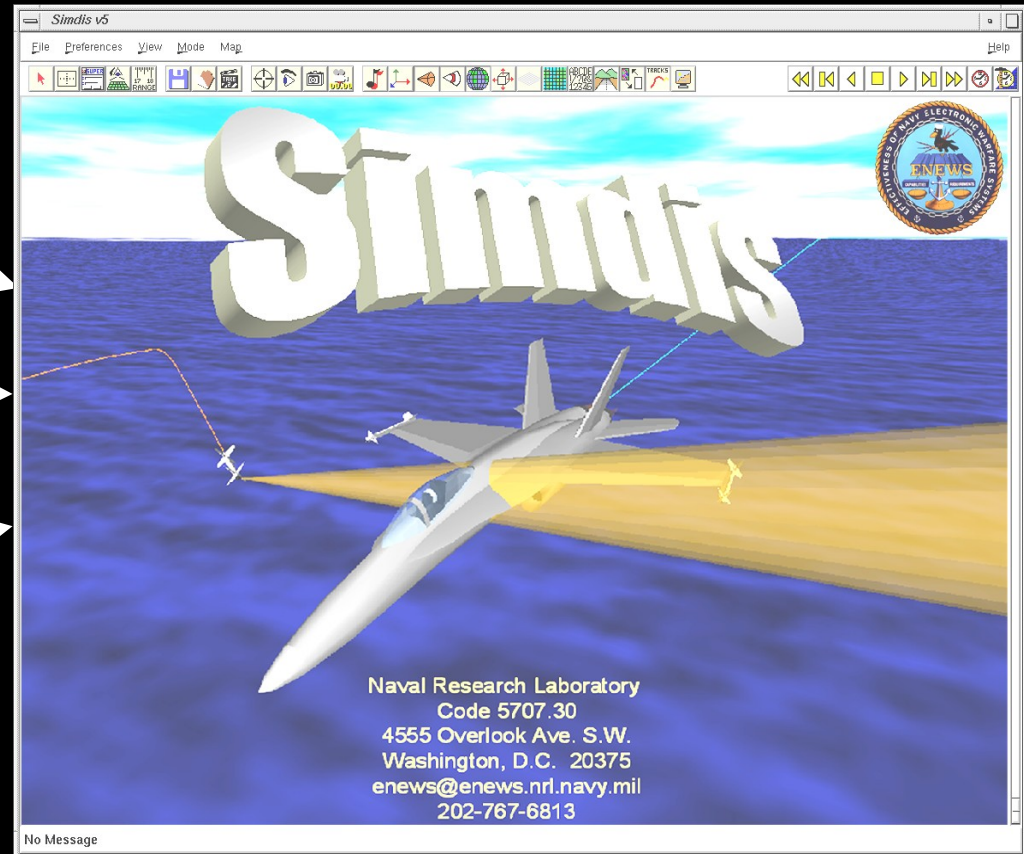


SIMDIS Application Areas

**Real-Time
Operational Use**

**Post Processing
Analysis**

VIP Demos



Status

- **SIMDIS v7.5 is current version (completed 12/28/2001)**
 - SGI IRIX 6.5
 - SUN Solaris 7,8
 - PC Windows 98, ME, NT 4.0, 2000, & Linux
- **SIMDIS 8.0 to be released in April**
 - Uses new DCS2 real-time client server interface to SIMDIS, Examples and interface source code released to allow users to develop their own real-time interfaces to SIMDIS
 - New utility programs for converting ESRI Shapefiles to SIMDIS GOG files for display (links to other programs supporting conversion of NIMA VPF files to ESRI Shapefiles)
- **SIMDIS Transitions**
 - Approx 250 DoD Users-to-date & Growing

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SIMDIS Toolset for T&E and Training Ranges

- **Real-Time Interactive 2D/3D Display**
 - Situational Awareness/Range Ops
 - Test Platform Telemetry Display
 - Local and Remote Viewing for VIPS and Engineers
- **Range/Missile Flight Safety**
 - Integrates with Range Safety Models/SIMS
 - Real-Time Decision Aid Customizable Display
- **Post Test Visualization Data Products**
 - SIMDIS Data Files
 - Scripted Playbacks Files
 - 3D Playbacks for Digital Videos/NTSC Video Tapes
 - Multimedia Playbacks for Mission Data Reviews

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SIMDIS Toolset

- **SIMDIS (3D Analysis and Display)**
 - Simdis (3D Display Program Executable)
 - Modelviewer (3D Model Display for viewing DWB or OPT models)
 - ConvertASI2FCT (Preprocessor for converting SIMDIS asi file to binary file)
 - ConvertCSV2ASI (Preprocessor for converting SCORE CSV file to SIMDIS asi file)
 - ConvertFCT2ASI (Support Program for exporting SIMDIS binary file to SIMDIS asi file)
 - Userinstall (Support Program for setting up SIMDIS environment variables)
 - Keyrequest (Support Program to display system ID for license key generation)
 - Python (Interpreted, Interactive OO Language used for SIMDIS Scripting)
 - Swig (Simplified Wrapper and Interface Generator used for SIMDIS Scripting)
 - TCS (TimeClientServer Object embedded for synchronized time control)
 - DCS/DCS2 (DataClientServer Object embedded for real-time data display)
- **Superplot (2D Plot and Scope Display)**
- **TCS (TimeClientServer - Application serves as Time Server Gui or Time receiver)**
- **SIMDISMediaPlayer (Digital Video Player with TCS for Time Synchronized Playbacks)**
- **DCS (DataClientServer sample application demonstrating real-time data feeds for display in SIMDIS)**

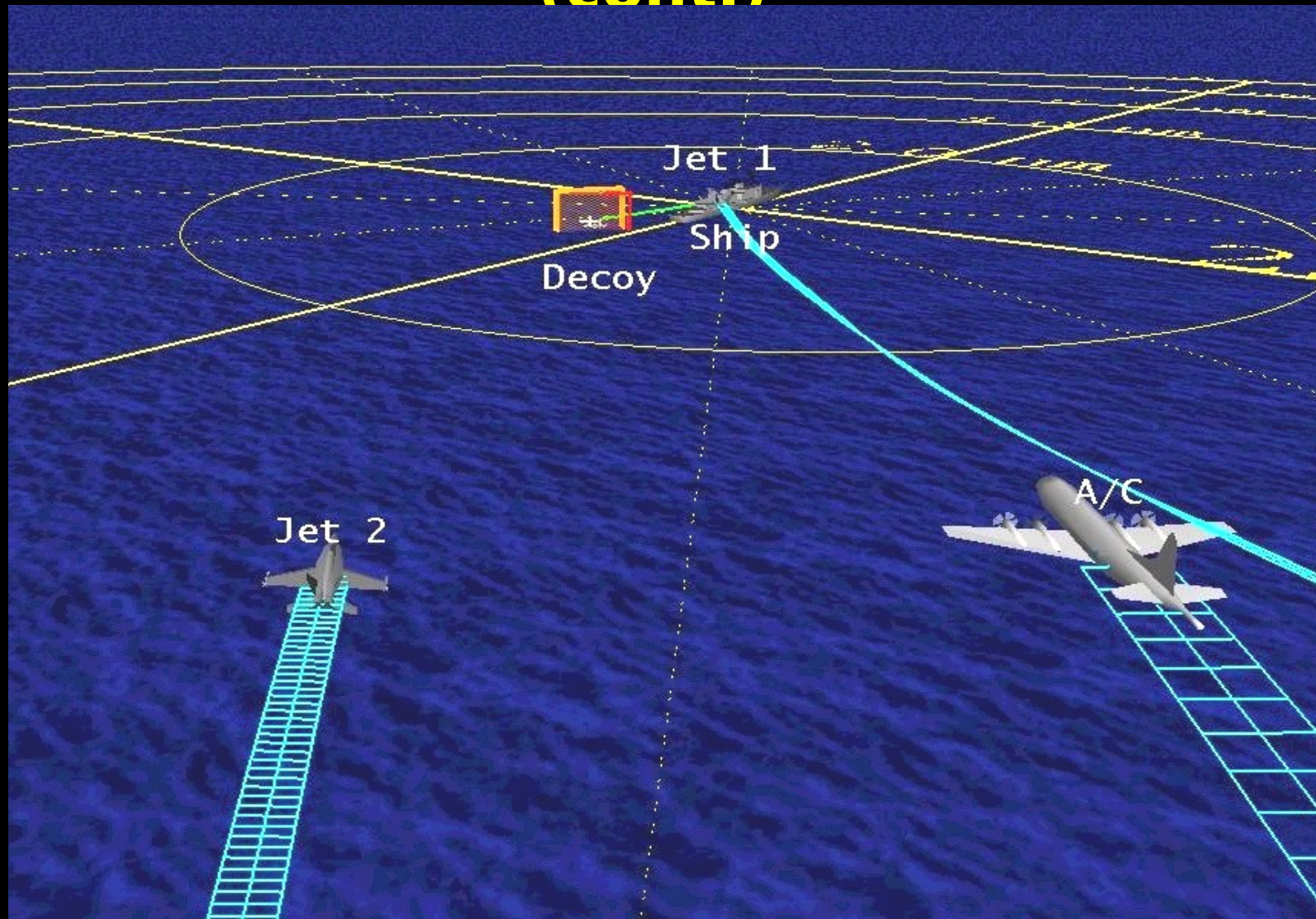
SIMDIS Toolset (cont.)

- **ReadScore (Real-Time Interface for receiving SCORE data packets and sending corresponding DCS packets to SIMDIS)**
- **ReadInet (Real-Time interface for receiving PMRF's INET packets and resending corresponding DCS packets to SIMDIS)**
- **GenMsg (Programs for generating real-time tracks on the network - used mainly for range safety contacts)**
- **SendGenericData (Application used for remote real-time SIMDIS display control)**

SIMDIS Reconstruction of Nulka OT

- **SIMDIS was instrumental in providing analysts and decision makers a “true view” of what actually occurred during Nulka’s August 1998 OT-IIB (supporting a Milestone IIIA decision)**
- **SIMDIS allowed all positional and sensor data sources to be integrated and viewed simultaneously in a common frame of reference**

SIMDIS Reconstruction of Nulka OT (cont.)



Real-Time use at PMRF

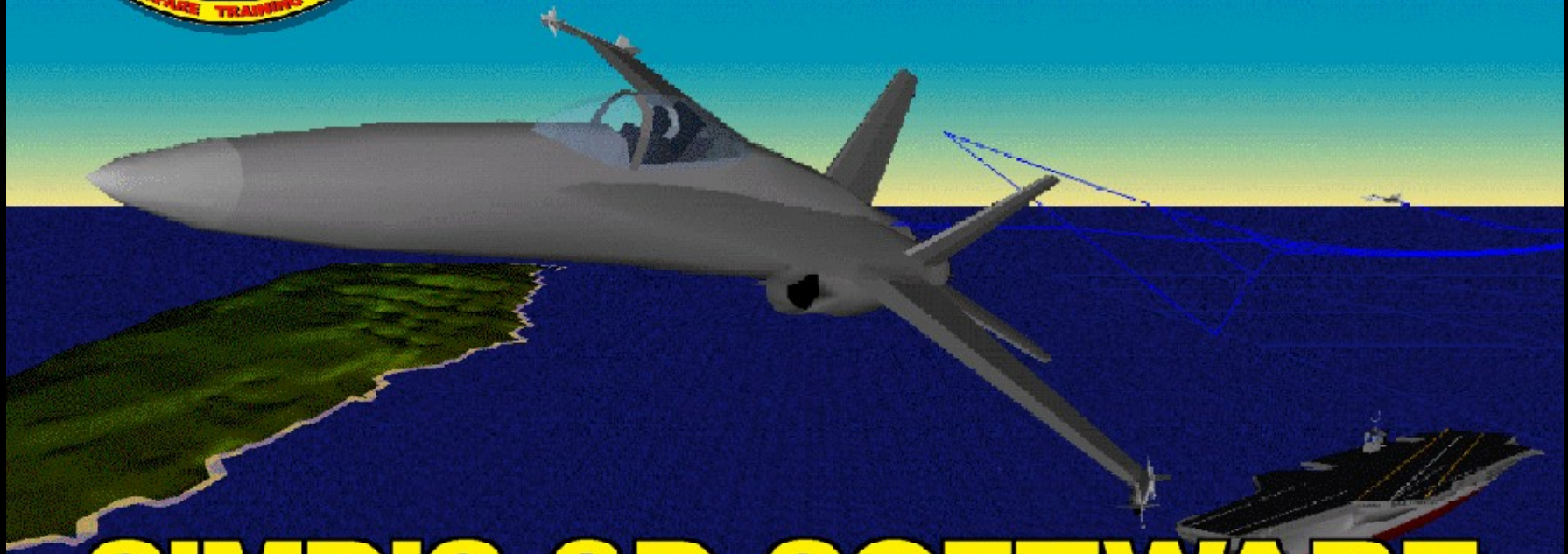


Operational at SCORE



Southern California Offshore Range

FACSFAC Det SCORE, NAS NI, PO BOX 357086, San Diego CA, 92135-7086



SIMDIS 3D SOFTWARE

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202-767-6813

Supporting TBMD at PMRF

Ect (3e-5): 2.582121e-07

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- Primary VIP & Missile Flight Safety Display



Time: 026 03:42:46.345
Time Step: 0.100 Secs
Distance: 1352804.064 m
Azim: 182.693°
Elev: 42.273°
Tethered: 1001 200 029

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Synchronized 3D Display with Digital Video



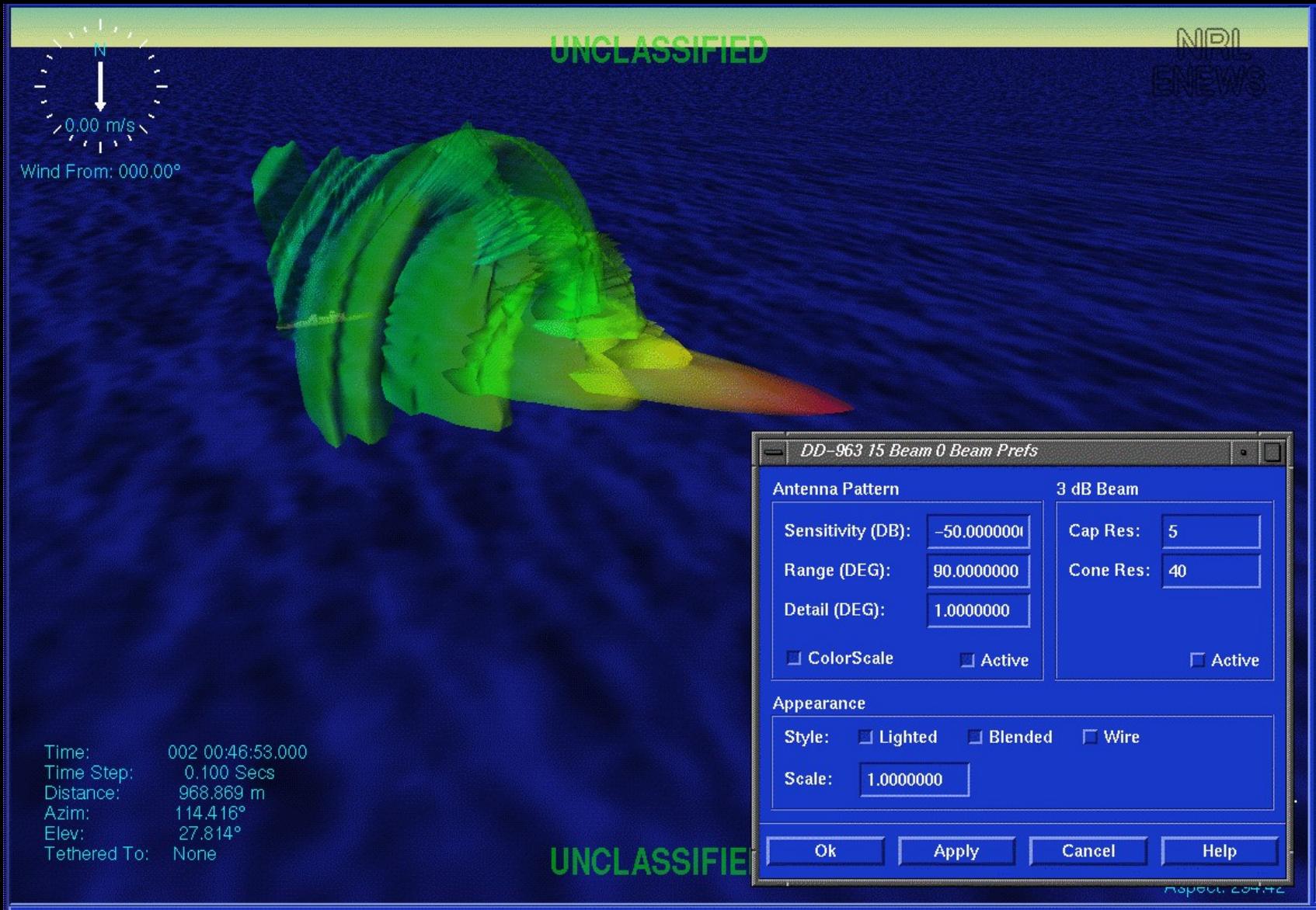
Terrier
Alt: 0.837 nm
Speed : 1190.692 knots



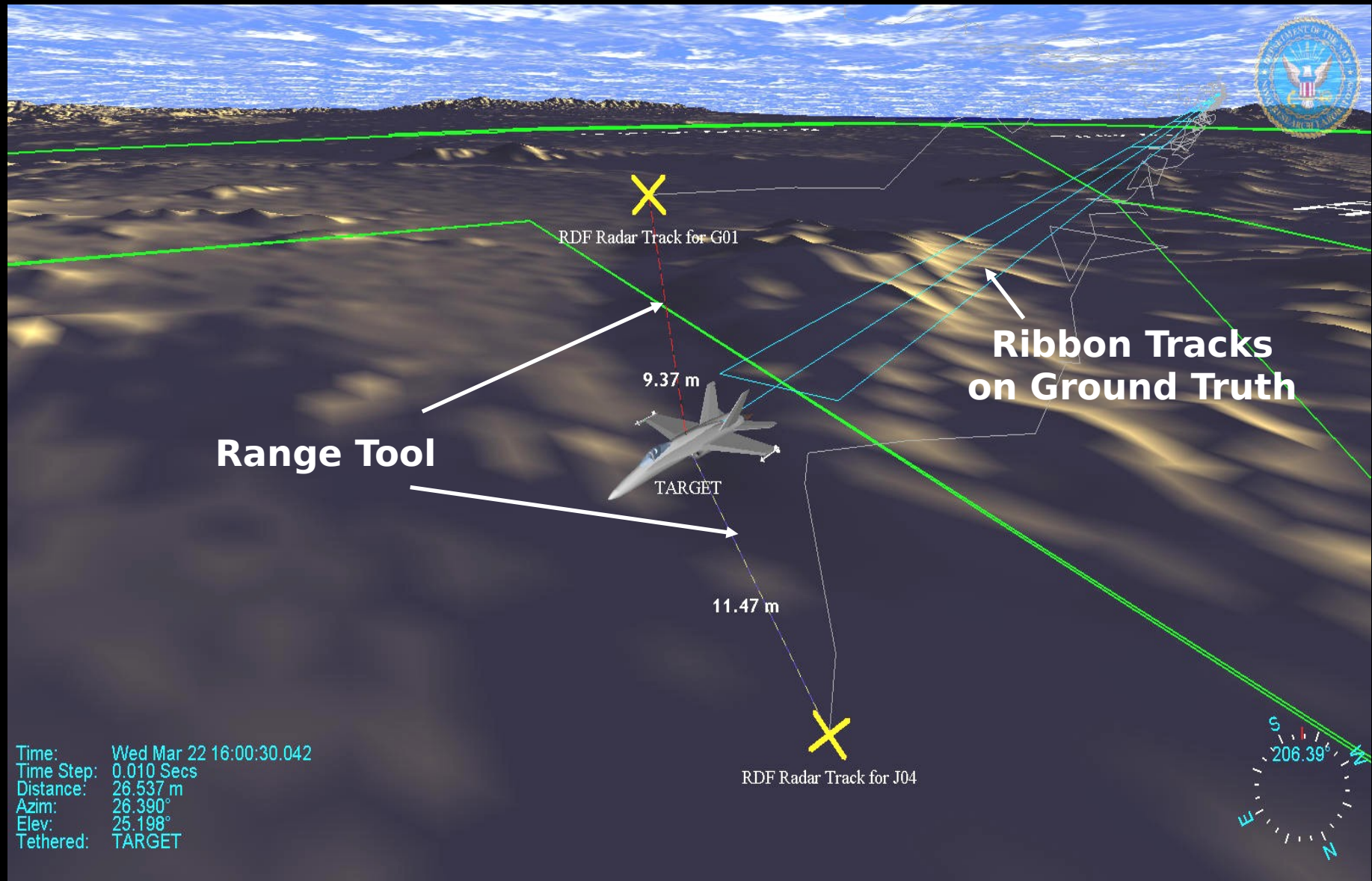
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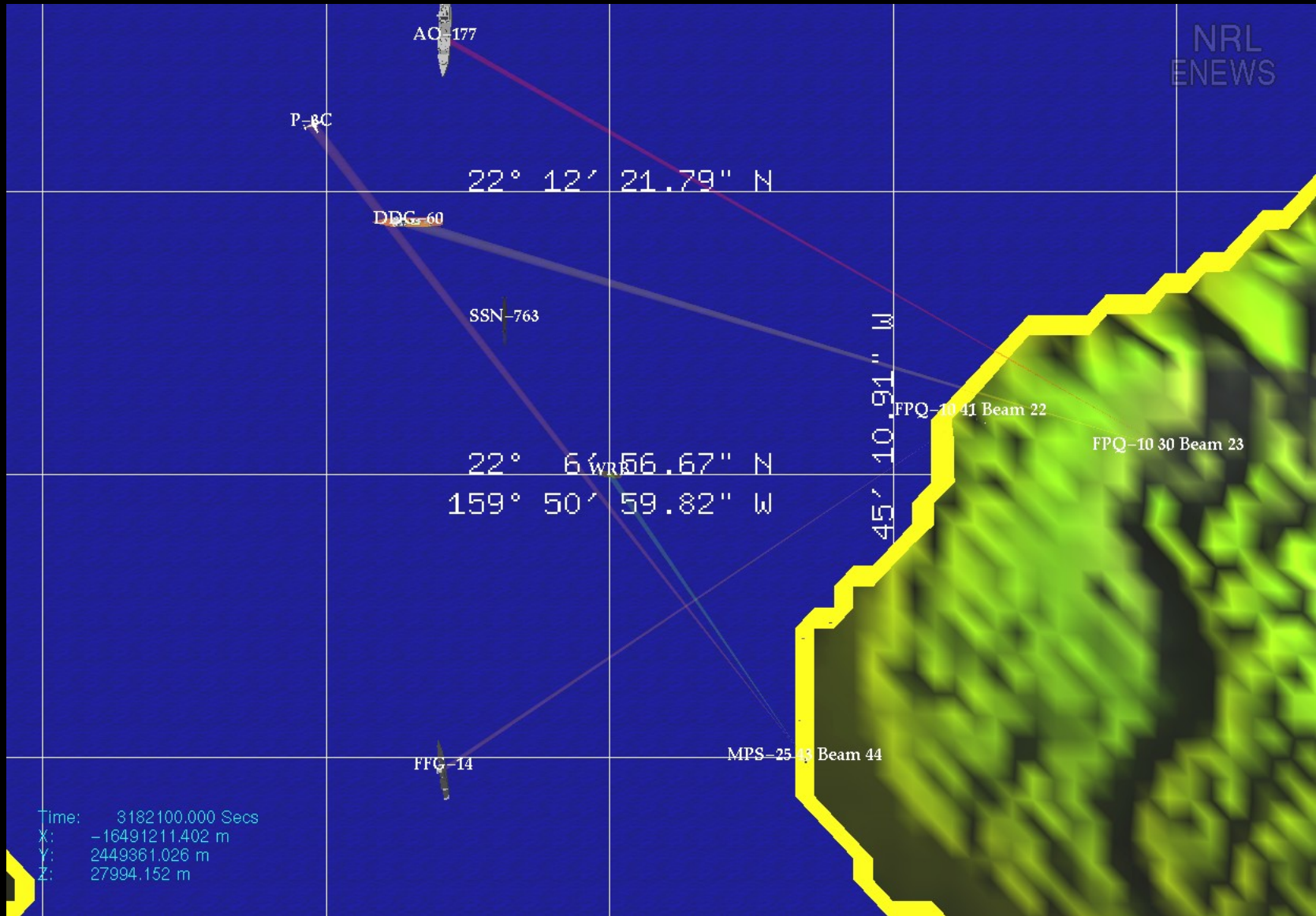
3D Visualization of Antenna Patterns



Visual Analysis of Test Data



Plan View Display Capability



Benefits of Integrated Real-Time SIMDIS Display

- **Rapid Understanding of Critical Test Issues**
 - Critical Component for TBMD Range Safety
 - Excellent Indicator of Real-Time Test System Performance
- **Improved Range Test Methods**
 - Integrated Test Scenario Plan with Live Battlespace Environment
 - Integrated Simulations and Ship Systems Data
 - Integrated Display of System TM Data with Battlespace Environment
- **Enhanced Verification Methods for Pre-Test Exercises (Rehearsals and Simulations)**
- **Excellent VIP Display for Live and Post-Test Displays**
- **Allows Integration with Remote Network Simulations and/or Sensors (using SDREN/SIPRNET, or other comms)**
 - Ship Systems
 - Warfare Labs/Centers Simulations
 - MHPCC

Future Plans

- **Integrate Battlespace Data to Provide Real-Time Analysis and Awareness**
- **Enhance Graphics Engine to Provide More Realistic Terrain/Environment**
- **SIMDIS Interface and Analysis Tool Enhancements**
- **Develop Custom Call-Back/Plug-In Capability Enabling Users to Integrate with Models/Sims/Hardware**
- **Investigate Additional Transitions to Navy and DoD Community**
- **Improve Documentation and On-Line Automated Support Site**
- **Develop and Implement Sustainment Plan**